TEXAS, ZONE 1
May 2003

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

UPLAND WILDLIFE HABITAT MANAGEMENT

(acre)
Code 645

Texas Supplement, Zone 1
BOBWHITE and SCALED QUAIL

HABITAT REQUIREMENTS

COVER

Quail are extremely dependent upon the even distribution of proper cover types. Several types of cover are required. These include nesting and brood rearing, loafing, roosting and escape cover. To meet these needs adequate grass and shrubs are needed plus areas of bare ground with overhead screening cover.

Nesting cover is most often the limiting factor in the High and Rolling Plains of Texas. Nesting is generally in residual cover of the previous years grass growth. Also shrubs and prickly pear cactus are important as they provide protection from overgrazing of grasses. An adequate number of nesting sites range from 300 to 500 per acre. This large number is needed to make it more difficult for predators to find the nests. Nesting sites of at least 1 square foot are needed. Two examples of preferred grasses for nesting sites are little bluestem and tobosa grass.

Heavy and continuous grazing have the greatest impact on nesting cover. During drought periods, this type of grazing intensifies cover losses. Long range grazing management decisions should be developed to account for drought periods and provide for light to moderate grazing.

To provide for loafing, screening and escape cover shrubs are necessary. Species such as lotebush, sand plum and skunkbush sumac provide this element in quail habitat. The desired density of this shrub cover is 10 to 20 per cent. Groups or motts of shrubs that are dense above and somewhat open beneath and 20 to 30 feet across are ideal loafing areas. These areas also provide shade during the summer and the dense low growing species provide thermal protection during winter.

FOOD

The primary food of quail is seeds. Seeds of many plants have been documented in their diet. These include forbs, woody plants, grasses and cultivated crops. Quail readily utilize insects in their diet. Insects are essential for chicks during the first 10 weeks of their life. Quail also will consume green matter of forbs and grasses during certain times of the year.

Bare ground and areas of limited vegetation are needed to enable quail to find seeds and insects. These areas should be interspersed with adequate screening and escape cover.

WATER

Quail can meet their daily water requirements from three different sources. (1) Free water from ponds, creeks, puddles, troughs or dew is used when available. Such water is considered a desirable but not essential part of quail habitat. (2) Succulent vegetation, fleshy

fruits and insects contain a high percentage of water. When these food items are eaten, they provide water for quail. (3) Metabolic water is a by-product of the chemical breakdown of carbohydrates in the digestion process. Metabolic water can provide about one-third of the water requirements of quail.

Nesting hens require extra water during the egg laying period. If adequate water is not present, egg production will be low.

HABITAT ARRANGEMENT

The proper interspersion of cover and food is especially critical for suitable quail habitat. The different cover types and food sources described above need to be very closely intermixed. In good habitat, birds will not have to travel more than 50 to 100 feet from low shrub cover. A variety of food plants should be found growing in and among nesting cover, screening cover and brood rearing cover. A large variety and abundance of insects will be found when there is diversity of grasses, forbs and shrubs. The presence and interspersion of surface water is less critical since quail derive most of their water from foods.

HABITAT SIZE

In order to maintain a viable long-term population of quail, it has been suggested that about 800 birds may be the minimum required. In the High and Rolling Plains, 2500 to 5000 acres of suitable and contiguous habitat may be required to maintain this population of quail. Fragmentation of landscapes that disrupts and isolates habitat is a serious threat to quail. Individual quail and coveys normally spend the great majority of their lives in a rather small area. Bobwhite quail usually live in areas of 20 to 40 acres while scaled quail will use larger areas of 80 to 300 acres. Therefore, if bobwhite habitat is desired across a 1000 acre tract, all habitat components would need to be present on each and every 40 acre area.

HABITAT MANAGEMENT TECHNIQUES

COVER

1. Grazing management must be a planned long range program that accounts for the frequent drought periods in this part of Texas.

2. Adequate nesting cover is extremely important in maintaining healthy quail populations. Heavy grazing is very detrimental to nesting cover and can shift the species composition of grasses. Even moderate grazing can limit adequate nesting cover. Light grazing favors a good distribution of nesting cover.

3. If bunchgrasses are absent or severely lacking due to prolonged heavy grazing, one to three years of no grazing may be needed for them to recover.

4. Range seeding of bunchgrasses may be needed if deferment alone is not adequate to restore nesting cover.

5. Brush management may be required when brush density is higher than recommended percentages (10-20 per cent). Brush management must be properly planned and applied to leave desirable shrubs and trees in a pattern that meets cover requirements. Carefully planned, selective brush management accomplishes the highest degree of shrub diversity. Indiscriminate treatments such as root-plowing and many herbicide applications decrease the long term shrub diversity.

6. Mechanical brush management should leave removed brush scattered across the pasture instead of raking into piles. This will provide short term cover and nursery sites for grass and forb growth.

7. Fire can be used as a clean-up tool following brush management and will also

maintain mott size and increase the time between brush treatments.

8. In areas with limited desirable grasses and forbs, reseeding disturbed areas following mechanical brush management speeds up herbaceous cover for quail.

9. Aerial herbicide application for brush management can be detrimental to some desirable shrubs. Leaving some areas untreated will provide better habitat diversity. Some herbicides will dimish the production of quail food plants for several years. In these cases individual plant treatment should be considered.

10. Cultivated fields need field borders and odd areas in native vegetation of grasses, forbs, shrubs and trees. The larger these areas are the better habitat they provide. Grain crop residues should be left standing until April 1each year to provide quail the best opportunity to utilize waste grain.

11. If shrubs are not present, the planting of desired species is an option. These can be planted in strips or motts. Strips should be 2 to 5 rows and use multiple species. Motts should have a minimum of 10 plants of desirable species. Plants should be planted and maintained to ensure good success. This includes using water harvesting techniques, rodent protection and replacing excessive death losses. Do not use invasive species such as Russian olive.

12. Where woody plants are present but do not have the correct growth form (such as mesquite), half-cutting can be done to create low shrubby growth. For best results, half cut multi-stemmed, smooth bark mesquite during the growing season.

FOOD

The following methods can be used to increase quail food supplies. Care must be taken to not increase food supplies at the expense of critical cover requirements. Cover types are generally much more of a limiting factor than food supplies.

1. Soil disturbances, such as disking, will reduce existing vegetation and promote forb production. Disking is generally done in late winter and early fall. Disking should be done in strips adjacent to good nesting and woody cover. To receive the greatest benefit disking should be done on 1 to 5 per cent of the habitat. Do not disk the same strips each year. For best results have strips that are disked in present year and strips that were disked the previous year.

2. Grazing can be used to promote low successional plants and increase quail food supply. This practice must be carried out carefully since a lack of nesting cover is more limiting to a quail population than the lack of food. The objective is to heavily graze small areas while leaving taller grass across the remainder of the pasture. This can be accomplished by herding, placement of watering facilities and feeding to concentrate grazing.

3. Fire can be used to remove or reduce excessive grass growth and encourage forb growth. Early winter burns promote cool season forbs. Late winter or early spring burns discourage cool season forbs, but encourages warm season forbs and may invigorate warm season bunch grasses. Prescribed burning, in accordance to a written burn plan and carried out under the supervision of an experienced burner, has many benefits to wildlife habitat. This practice must be carried out carefully, as fire also temporarily removes nesting and woody cover. An ideal burn would be a mosaic burn, where the fire does not burn completely but leaves unburned areas interspersed with burned areas. One third to one half of the area should be left

unburned. Burning that creates a cooler fire or using internal firebreaks will help ensure a mosaic burn.

4. Fire and grazing in combination can be used to develop plots with lower successional plants. Burn numerous 2 to 5 acre plots within larger pastures. When the pasture is grazed, livestock will move to the burned plots and graze them heavily, thus favoring the growth of lower successional plants.

5. Cropland fields can be planted to grain sorghum, cowpeas, sesame, wheat, oats or rye to add large amounts of seed for quail. For added food leave 8-12 rows of unharvested grain crops around field edges. Leave crop residue on the soil surface until April 1 for better utilization of waste grain.

6. Annual food plots can be a source of food for quail if they are properly planted and managed. Food plots are not likely to increase quail numbers, but will often attract quail. They should be planned to provide at least one acre of food plot for each 20 to 40 acres of habitat. Food plots must be protected from livestock and deer if numbers are high. Selected adapted dryland varieties and mixtures are many times better than single species plantings. Food plots can never replace good managed native habitat.

7. Include forbs, legumes and large hard seed grasses in range seeding mixtures.

8. Feeding quail is not considered a habitat management practice. Feeding may or may not improve quail populations, but it will concentrate quail in the vicinity of feeders. Predators often learn the locations of quail feeders and losses may increase by the use of feeders.

WATER

1. The greatest possible plant diversity will help ensure a good supply of insects, green matter and fleshy fruits that provide the majority of the water needed by quail. Plant diversity can be increased by light to moderate grazing and carefully planned brush management.

2. To supplement water supplies in periods when insects and succulent vegetation are not present, surface water may be provided. Overflow areas from livestock water facilities, ground level watering devices or modifications of livestock water facilities can be used to provide surface water. One important benefit of these overflow areas is the green spots they create which attract insects.

3. The construction of spreader dams or shallow depressions that catch runoff can concentrate rainfall to produce additional green spots.

4. Refer to the practice standard for Wildlife Watering Facility, Code 648, for typical designs.

REFERENCES

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APPROVAL

/s/ Gary Valentine
State Wildlife Biologist
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TABLE 1

IMPORTANT NATIVE AND NATURALIZED* QUAIL FOOD PLANTS

ANNUAL FORBS	PERENNIAL FORBS	GRASSES	WOODY
Texas croton	Western ragweed	Johnsongrass*	Mesquite
Tropic croton	Maximilian sunflower	Browntop panicum	Catclaw acacia
Common sunflower	Dayflower	Texas panicum	Catclaw mimosa
Common broomweed	Wild bean	Hall's panicum	Bumelia
Buffalobur	Illinois bundleflower	Plains bristlegrass	Hackberry
Pigweed	Western indigo	Fringed signalgrass	Oak
Pricklypoppy	Indian rushpea	Slim tridens	Juniper
Snow-on-the-mountain	Leatherweed croton	Arizona cottontop	Wolfberry
Spurges	Perennial spurges	Rescuegrass*	Littleleaf sumac
Giant Ragweed	Queen's delight		Skunkbush sumac
Common ragweed	Indian mallow		Pricklypear
Lambsquarter*	Sida		Tasajillo
Russian thistle*	Globemallow		Algerita
Partidgepea	Texas nightshade		Lotebush
Spectaclepod	Ground cherry		Elbowbush
	Sand lily		Broom snakeweed
	Buffalogourd		
	Balsamgourd		

*Indicates non-native plants that have become naturalized

TABLE 2
PLANTING INFORMATION
COMMERCIALLY AVAILABLE SEEDS

	Seeding rate # Per Ac					
	Broadcast or Drilled	Rows	Planting Dates	Planting Depth In.	Minimum Rainfall	Comments
ANNUALS						
Grain Sorghum	12*	4*	5/1 - 7/15	1 - 2	18	Includes all types
Sunflower	15*	5*	5/1 - 7/15	1 - 2	18	
Mungbeans	15*	5*	5/1 - 6/15	1 - 2	20	Should be inoculated
Cowpeas	15*	5*	5/1 - 7/15	1 - 2	18	Should be inoculated
Sesame	5*	1.5*	5/1 - 6/30	1/2 -1	18	
Pearl Millet	10*	3*	5/1 - 6/30	1/2 - 1	20	
Partridge Pea	13.4	5	4/1 - 5/30	1/4 - 1/2	18	Sandy Soils, Reseeder
COOL SEASON ANNUALS						
Wheat	60*	20*	9/1 - 11/1	1 - 2	18	
Rye	60*	20*	9/1 - 11/1	1 - 2	20	
Yellow Sweetclover	3.4*	NR	9/1 - 11/30	1/4 - 1/2	16	Biennial, Should be inoculated
White Sweetclover	3.4*	NR	9/1 - 11/30	1/4 - 1/2	18	Biennial, Should be inoculated
PERENNIALS						
Illinois Bundleflower	13.6	4.5	12/1 - 5/30	1/4 - 1/2	18	Should be inoculated
Alfalfa	4*	1.5*	9/1 - 5/30	1/4 - 1/2	18	Should be inoculated
Alamo Switchgrass	2	1	12/1 - 5/30	1/4 - 1/2	22	
Blackwell Switchgrass	3.5	1	12/1 - 5/30	1/4 - 1/2	16	

Notes:

* - These are commercial rates. All others are PLS rates.
Row planting can be used to allow native desirable plants to establish between rows.
Approximate annual rainfall recommended for successful establishment.
All legumes should be inoculated with the proper strain of Rhizobium for best results.
The grain sorghum includes such types as WGF, Egyptian wheat, African millet, Hegari, etc.